Houston Production Manager's Association

Judging print quality

of

Introduction

- ***Quality*** **is a subjective term related to how well a printed product meets its stated objective – its more "feel" than "measure."**
  - **If a product does its job, it can be called a "quality" product**
- ***Measurement*** **of print variables is objective**

Communicating about quality

- **Printers and buyers need a framework of quality expectation levels to accurately communicate with each other.**
  - **Not every job must be "perfect."**
    - **Perfect jobs cost too much**
- **Once the buyer and printer agree upon the level of quality to be attained, acceptable variations in print quality variables can be defined.**

Agenda

- **Suggested quality levels**
- **Print-quality variables**
- **Measuring variables**
- **Suggested standards of variability for each quality level**

Quality levels

- **Basic**
  - **Single color memos, circulars, etc.**
- **Good**
  - **Single- and multi-color books, magazines, direct-mail advertising**
- **Premium**
  - **Better catalogs, annual reports**
- **Showcase**
  - **Annual reports, art books, printers' sales literature**

Print-quality variables

- **Register**
- **Density**
- **Screen percentages**
- **Dot gain**
- **Color Match**
- **Halftones**
- **Separations**
- **Minor flaws**
- **Coatings**
- **Finishing**

Register

- How well the images align with one another and to the sheet
- Variation caused by problems with press front stops, side guide or grippers
- Tools: Register marks and magnifier: measure variation in thousanths of an inch or millimeters
  - Avoid subjective terms like “hairline” or “two rows of dots”

Quality levels and register

- Basic: ± .015”
- Good: ± .010”
- Premium: ± .005”
- Showcase: ± no variation

Density

- Darkness of the printed ink layer measured in logarithmic numerals
  - a density of 1.00 means that 1/10 of the light striking an area is returned
  - a density of 2.00 means that 1/100 of the light striking an area is returned
- Variation caused by amount of ink or water fed to plate

Density

- Variations can be overall or specific to given areas
  - the entire sheet can be too light/dark
  - certain areas may be too light/dark
  - some sheets may be darker/lighter than others
- Tools: Densitometer and color patches
- Appropriate density numbers vary by color and by job.
  - Yellow: ± 0.90; Cyan and Magenta: ± 1.40; Black: ± 1.60

Quality levels and density

- Basic: ± 7% variation from established density numeral
- Good: ± 5% variation from established density numeral
- Premium: ± 3% variation from established density numeral
- Showcase: ± 1% variation from established density numeral

Screen percentages

- Percent of printed area covered by dots
- If you specify a screen tint of 20%, you shouldn’t get 30%!
  - Some variation is likely, due to dot gain
- Variations caused by errors in imagesetting, stripping, platemaking and presswork.
- Tools: Densitometer (dot area function), color patch, printed screened area.

Quality levels and screen percentages

- Basic: ± 10% from nominal percentage
- Good: ± 5% from nominal percentage
- Premium: ± 2% from nominal percentage
- Showcase: no variation from nominal percentage

Dot gain

- Enlargement of printed dot due to application of pressure and effect of rubber blanket.
  - All offset presses gain – and they all gain somewhat differently
    - range from 5% for sheetfed printing to 40% for webfed on newsprint
    - presses in poorer mechanical condition usually gain more than those in good condition
  - Allowances for dot gain should have been built into the separations and proofs

Dot gain

- Dot gain is predictable and not a flaw if the printer makes proper allowances
  - Gain in excess of allowance results in a too-dark image
  - Dot gain should remain the same throughout the run
- Tool: GATF Star Target (often included in color patches) visually depicts the extent of dot gain.

Dot gain

- Percentage of dot gain can be calculated by comparing the dot on the plate with a corresponding dot on a press sheet using a densitometer (dot area function).

Quality levels and dot gain

- Basic: ± 10% from nominal percentage
- Good: ± 5% from nominal percentage
- Premium: ± 1% from nominal percentage
- Showcase: 1 % from nominal percentage

Color match

- Comparison of the printed sheet to the proof and/or swatch book.
  - Do not compare a press sheet to a computer monitor
- Applies to both flat (spot) color and process color

Color match

- Variations occur when
  - the wrong ink color is put onto the press
  - when a PMS color is incorrectly mixed
  - when a PMS color is incorrectly simulated with process inks
  - dot gain
  - color viewed under incorrect lighting
  - paper alters perceived color

Color match

- Tools:
  - Color swatch book (PMS, etc.)
  - Contract proof (one that is made from the negatives) such as Match Print
  - GATF/RHEM light indicator
  - Photo Spectrometer
- Be absolutely sure to compare colors under controlled lighting conditions (5000˚K)

Quality levels and color match

- Basic: Slight perceptible diffrences
- Good: Just noticeable differences
- Premium: No perceptible differences
- Showcase: No measureable differences

Halftones

- Reproduction of single color (usually black and white) pictures
- Quality variations due to:
  - density differences inherent in the printing process – ink is not as black as silver
  - errors in scanning, halftone photography, platemaking, dot gain
  - surface and absorbancy of the paper
- Tools: densitometer, magnifier, proof

Halftones

- Measure Halftones using densitometer
  - Measure density of darkest area and density of lightest area
  - Subtract lightest area density from darkest area density. Result is density range.
- Inspect halftone dots with magnifier
  - Inspect edges of halftone dots: they may range from fuzzy to sharp
- Compare shahow areas to the proof– are shadow dots clean or plugged?

Quality levels and halftones

- Basic: Density range = 0.90; no shadow detail; slightly fuzzy dots
- Good: Density range = 1.20; some shadow detail; sharp dots
- Premium: Density range = 1.50; full shadow detail; very sharp dots
- Showcase: Density range = 1.80; almost match original prints

Separations

- Calibrated sets of halftones designed to simulate full color photographs
- Quality variations due to:
  - density differences inherent in the printing process – ink is not as black as photographic dyes
  - errors in scanning, , platemaking, dot gain
  - color, surface and absorbancy of the paper
  - ink colors
  - trapping (ink sticking to previous color)

Separations

- Tools: densitometer, proof, GATF/RHEM light indicator, magnifier
- Measure separations using densitometer
  - Measure density of darkest area and density of lightest area
  - Subtract lightest area density from darkest area density. Result is density range.
- Inspect halftone dots with magnifier
- Compare print to proof under controlled lighting conditions

Quality levels and separations

- Basic: Not applicable
- Good: Pleasing color; density range 1.20
- Premium: Almost match transparencies; density range 1.60
- Showcase: ALmost match product or scene; density range 2.00

Quality levels and minor flaws

- Include scumming, setoff, hickies, smudges, wrinkles, doubling, slurring, or any other visual defect
- Basic: On maximum of 10% of the sheets
- Good: On maximum of 5% of the sheets
- Premium: On maximum of 2% of the sheets
- Showcase: On 0% of the sheets

Quality levels and coatings

- Varnish, UV, film laminates should have no cast (discoloration) and should not peel, blister or cause curling
- Basic: Not applicable
- Good: Uniform, slight cast and flaws
- Premium: Uniform, no cast or flaws
- Showcase: Uniform, no cast or flaws

Quality levels and finishing

- Accuracy of dies cuts, drills, folds, trims, scores and perfs.
- Measure with an accurate ruler
- Basic: ± 1/16
- Good: ± 1/32
- Premium: ± 1/64
- Showcase: ± 1/64

Summary

- While quality is a subjective term, measurement is objective
- Quality expectations can be defined through descriptive labels called quality levels
- Acceptable levels of variation in each printing variable can be assigned to each quality level

Summary

- Such a scheme will help designers decide how critical to be for various jobs.
- Such a scheme will help printers meet the needs of their clients

Where to get more information

- *Getting it Printed* by Mark Beach
- GATF *Test Images for Printing* Book
- Equipment manufacturers
  - Scanners
  - Imagesetters
  - Proofing
  - Presses